

Clouds and Precipitation

Clouds are mostly water. To understand how clouds form, remember how changes in temperature affect humidity. **STOP** Think of a clear spring day when the sun warms the ground, which in turn warms the air. Warm air holds a certain amount of water, and warm air rises. Eventually, the warm air cools when it joins the cooler air away from the ground. At the cooler temperature the air cannot hold as much water vapor. As the water vapor separates from the air, it connects with dust and microscopic particles of salt to form tiny drops of water. They are so small and light that they float in the air. Collections of millions of these droplets form clouds. **STOP**

As clouds move in the wind and evaporate, they may take on different shapes. Clouds may be classified into a few basic kinds with a few different shapes. **STOP** The types of clouds are classified according to their height above the ground. And the names of clouds give a clue to their appearance. For example, low clouds that are close to the ground are usually thick, even sheets. The term *strato* means “sheetlike,” so the low sheetlike clouds are called stratus clouds. You can see these clouds in the first photo.



Middle-level clouds may appear in groups in an otherwise blue sky. *Cumulo* means “pile or heap,” so these middle-level groups of clouds are a type of cumulus cloud. These are pictured in the second photo below.



High clouds that are wispy with curled edges across a background of blue sky are called cirrus clouds because *cirrus* means “curl.” The third photo is a good example of cirrus clouds. **STOP** Finally, there are clouds that build upon each other into very high vertical clouds. Because they occur in heaps, they are a type of cumulus cloud, but because they often result in thunderstorms they are called cumulonimbus because *nimbo* means “rain.” **STOP**



Clouds are associated with rain and snow. Most rain that occurs in the United States begins as snow. Ice crystals that are high in the cirrus clouds grow when more and more water vapor condenses on them. **STOP** Eventually, they become so heavy that the crystals start to fall. When ice crystals fall through clouds, they may collide and combine with other ice crystals or water droplets. When the crystals become too heavy to float in the air, they drop as precipitation. **STOP**

If all the bands of air that the crystals fall through are cold, then the precipitation reaches the ground as snow. If the ice crystals fall far enough through warm air, they reach the ground as rain.

Sometimes if a band of cold air is near the ground, the rain becomes colder and freezes when it hits the ground. This is freezing rain that becomes ice on the ground, making walking and driving dangerous. **STOP**

Hail is formed when ice crystals are thrown up and down within a cumulonimbus cloud. Water collects on the crystal as it falls through the cloud and freezes on the crystal as it rises higher in the cloud. The hailstone grows larger in this way until it becomes too heavy to float and then falls to the ground. **STOP**